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**European Technical Assessment Body
for construction products**



European Technical Assessment

**ETA-25/0651
of 8 September 2025**

English translation prepared by DIBt - Original version in German language

General Part

Technical Assessment Body issuing the
European Technical Assessment:

Deutsches Institut für Bautechnik

Trade name of the construction product

Alfa Concrete Screw

Product family
to which the construction product belongs

Mechanical fasteners for use in concrete

Manufacturer

Alfa GmbH
Ferdinand-Porsche-Straße 10
73479 Ellwangen
GERMANY

Manufacturing plant

Werk 3, D

This European Technical Assessment
contains

19 pages including 3 annexes which form an integral part
of this assessment

This European Technical Assessment is
issued in accordance with Regulation (EU)
No 305/2011, on the basis of

EAD 330232-01-0601, Edition 05/2021

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Specific Part

1 Technical description of the product

The Alfa Concrete Screw is an anchor in size 6, 8, 10, 12 and 14 mm made of galvanised steel respectively steel with zinc flake coating, made of stainless or high corrosion resistant steel. The anchor is screwed into a predrilled cylindrical drill hole. The special thread of the anchor cuts an internal thread into the member while setting. The anchorage is characterised by mechanical interlock in the special thread.

Product and product description are given in Annex A.

2 Specification of the intended use in accordance with the applicable European Assessment Document

The performances given in Section 3 are only valid if the anchor is used in compliance with the specifications and conditions given in Annex B.

The verifications and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life of the anchor of at least 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

3 Performance of the product and references to the methods used for its assessment

3.1 Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Characteristic resistance to tension load (static and quasi-static loading)	See Annex B2 and C1
Characteristic resistance to shear load (static and quasi-static loading)	See Annex C1
Displacements (static and quasi-static loading)	See Annex C6
Characteristic resistance and displacements for seismic performance category C1 and C2	See Annex C2 to C4 and C7

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Class A1
Resistance to fire	See Annex C5

3.3 Aspects of durability linked with the Basic Works Requirements

Essential characteristic	Performance
Durability	See Annex B1

4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base

In accordance with European Assessment Document EAD No. 330232-01-0601 the applicable European legal act is: [96/582/EC].

The system to be applied is: 1

5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable European Assessment Document

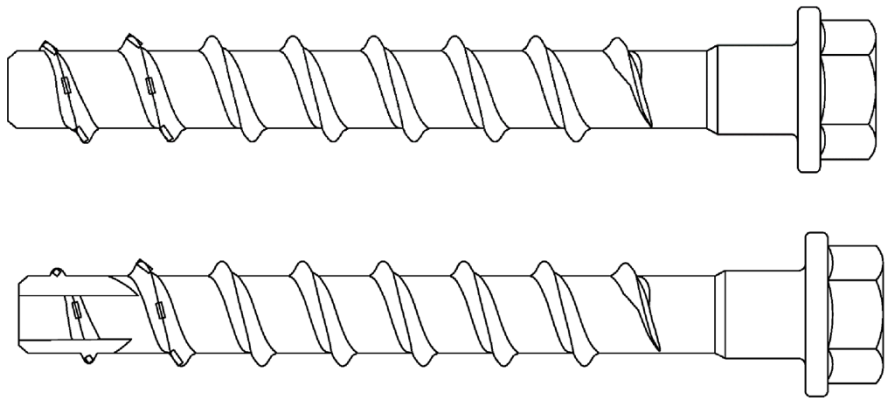
Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at Deutsches Institut für Bautechnik.

Issued in Berlin on 8 September 2025 by Deutsches Institut für Bautechnik

Dipl.-Ing. Andreas Kummerow
Head of Department

beglaubigt:
Baderschneider

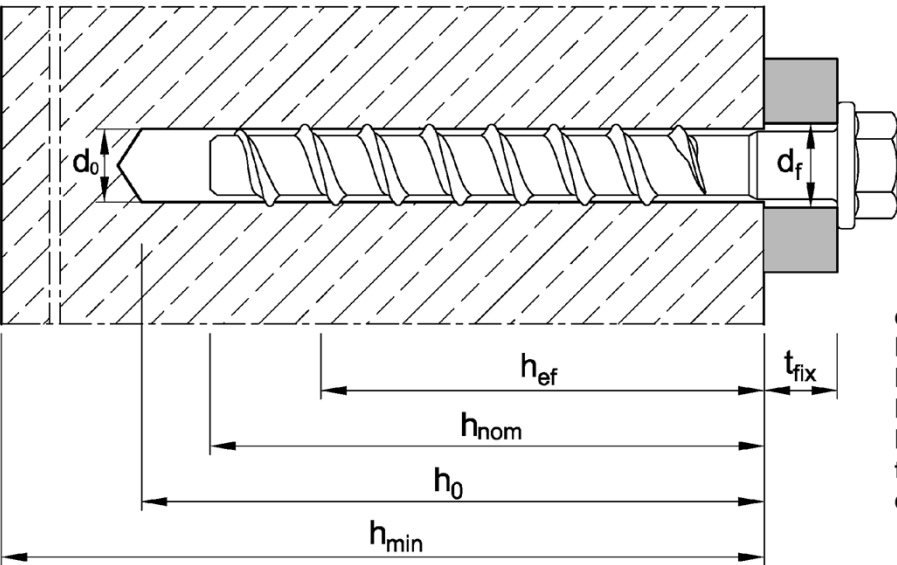
Alfa Concrete Screw



Alfa Concrete Screw:
zinc plated
stainless steel A4
HCR

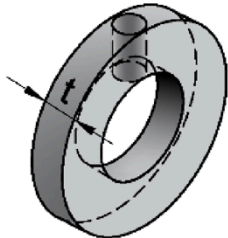
Installation situation in concrete

(e.g. Alfa Concrete Screw with hexagon head and pressed-on washer)

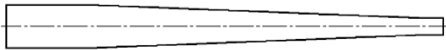


- d_0 = nominal drill bit diameter
- h_{ef} = effective anchorage depth
- h_{nom} = nominal embedment depth
- h_0 = depth of the drill hole
- h_{min} = minimum thickness of member
- t_{fix} = thickness of fixture
- d_f = diameter of clearance hole in the fixture

Alfa Filling washer VS and reducing adapter for filling the annular gap between concrete screw and fixture



thickness of filling washer
 $t = 5 \text{ mm}$

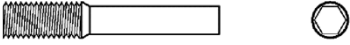
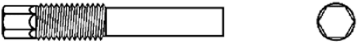

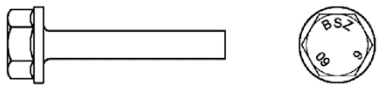

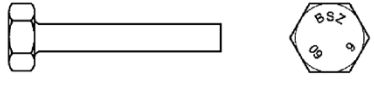
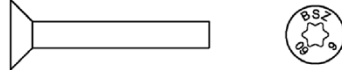


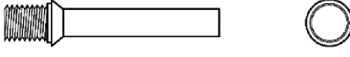
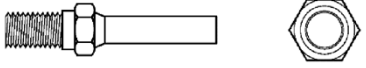
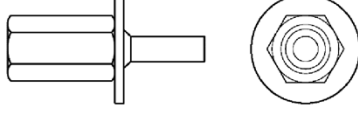


Alfa Concrete Screw

Product description
Product and installation situation

Annex A1

Table A1: Anchor types and description

Anchor types			Alfa Concrete Screw	Description
1			IS-M-V	Anchor version with metric connection thread and hexagon socked
2			SW-M-E	Anchor version with metric connection thread and hexagon drive
3			SKK-TG-V TX	Anchor version with hexagon head, pressed-on washer and TORX drive
4			SKK-TG-V	Anchor version with hexagon head and pressed-on washer
5			SKKBU-TG-V	Anchor version with hexagon head and collar
6			SKK	Anchor version with hexagon head
7			SK-TG-V	Anchor version with countersunk head and TORX drive
8			LK-TG-V	Anchor version with pan head and TORX drive
9			GLK-TG-V	Anchor version with large pan head and TORX drive
10			SK-M-V	Anchor version with countersunk head and metric connection thread
11			StS-M-V	Anchor version with hexagon drive and metric connection thread
12			Mf-IG-V	Anchor version with internal thread and hexagon drive

Alfa Concrete Screw

Product description
Anchor types and description

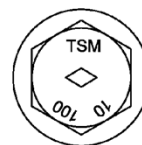
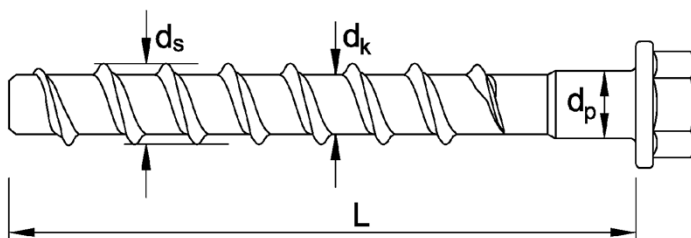
Annex A2

Table A2: Dimensions

Alfa Concrete Screw			Anchor size													
			6		8			10			12			14		
Nominal embedment depth	h_{nom}	[mm]	40	55	45	55	65	55	75	85	65	85	100	75	100	115
Length of the anchor	$L \leq$	[mm]	500													
Core diameter	d_k	[mm]	5,1		7,1			9,1			11,1			13,1		
Outside diameter	d_s	[mm]	7,5		10,6			12,6			14,6			16,6		
Shaft diameter	d_p	[mm]	5,7		7,9			9,9			11,7			13,7		

Marking e.g.: \diamond BSZ 10 100

or TSM 10 100



\diamond BSZ Trade name
or (optional with manufacturer
TSM identification \diamond)

10 Anchor size

100 Length of anchor

additional marking:

A4 stainless steel

HCR high corrosion resistant steel

BC ST version with hexagon head
and collar

Table A3: Materials

Version	Steel, zinc plated Alfa Concrete Screw zinc plated	Stainless steel Alfa Concrete Screw stainless steel A4	High corrosion resistant steel Alfa Concrete Screw HCR
Material	Steel EN 10263-4:2017 galvanized acc. to EN ISO 4042:2018 or zinc flake coating acc. to EN ISO 10683:2018 ($\geq 5\mu\text{m}$)	1.4401, 1.4404, 1.4571, 1.4578	1.4529
Nominal characteristic steel yield strength f_{yk}	560 N/mm ²		
Nominal characteristic steel ultimate strength f_{uk}	700 N/mm ²		
Elongation at fracture A_s	$\leq 8\%$		

Alfa Concrete Screw

Product description
Dimensions, marking and materials

Annex A3

Specifications of Intended use

Alfa Concrete Screw		Anchor size													
		6		8			10			12			14		
Nominal embedment depth h_{nom} [mm]		40	55	45	55	65	55	75	85	65	85	100	75	100	115
Anchorage subject to	Static or quasi-static loading	✓													
	Fire exposure	✓													
	Seismic action C1 (zinc plated, A4, HCR)	Tension load: IS-M-V, SW-M-E, SKK-TG-V TX, SKK-TG-V, SKK, SK-TG-V, LK-TG-V, GLK-TG-V, SK-M-V, StS-M-V, Mf-IG-V Shear load: IS-M-V, SW-M-E, SKK-TG-V TX, SKK-TG-V, SKK, SK-TG-V, LK-TG-V, GLK-TG-V													
		✓	1)		✓	✓	1)	✓	1)	✓	1)	✓			
	Seismic action C2 (zinc plated)	Tension load and shear load: <u>with filled annular gap</u> : IS-M-V, SW-M-E, SKK-TG-V TX, SKK-TG-V, SKK, LK-TG-V, GLK-TG-V <u>without filled annular gap</u> : IS-M-V, SW-M-E, SKK-TG-V TX, SKK-TG-V, SKK, SK-TG-V ²⁾ , LK-TG-V, GLK-TG-V													
1)		1)		✓	1)	1)	✓	1)	✓	1)	✓				
Base material	Cracked or uncracked concrete	✓													
	Reinforced or unreinforced concrete (without fibres) acc. to EN 206:2013+A1:2016	✓													
	Strength classes according to EN 206:2013+A1:2016, C20/25 to C50/60	✓													

¹⁾ No performance assessed

²⁾ Version SK-TG-V, Anchor size 8 and Anchor size 10

Use conditions (Environmental conditions):

- Structures subject to dry internal conditions: all materials
- For all other conditions corresponding to corrosion resistance classes CRC according to EN 1993-1-4:2006 +A1:2015:
 - stainless steel A4, according to Annex A3, Table A3: CRC III
 - high corrosion resistant steel HCR, according to Annex A3, Table A3: CRC V

Design:

- Anchorage are designed under the responsibility of an engineer experienced in anchorages and concrete work.
- Verifiable calculation notes and drawings are prepared taking account of the loads to be anchored. The position of the anchor is indicated on the design drawings (e.g. position of the anchor relative to reinforcement or to supports, etc.)
- Design method of anchorages according to EN 1992-4:2018 (if necessary in connection with EOTA Technical Report TR 055, version February 2018)

Installation:

- Making of drill hole by hammer drilling or vacuum drill bit.
When using a vacuum drill bit no drill hole cleaning is required.
- Anchor installation carried out by appropriately qualified personal and under the responsibility of the person responsible for technical matters on site.
- After installation further turning of the anchor is not possible. The head of the anchor is supported on the fixture and is not damaged.
- The borehole may be filled with the Injection Systems VME plus.
- Adjustment according to Annex B5 (except for anchorages with filled borehole and anchorages subject to seismic action).

Alfa Concrete Screw

Intended use
Specifications

Annex B1

Table B1: Installation parameters

Alfa Concrete Screw			Anchor size														
			6		8			10			12			14			
Nominal embedment depth	h_{nom}	[mm]	40	55	45	55	65	55	75	85	65	85	100	75	100	115	
Nominal drill bit diameter	d_0	[mm]	6		8			10			12			14			
Cutting diameter of drill bit	$d_{cut} \leq$	[mm]	6,40		8,45			10,45			12,50			14,50			
Effective anchorage depth	h_{ef}	[mm]	31	44	35	43	52	43	60	68	50	67	80	58	79	92	
Depth of drill hole	$h_0 \geq$	[mm]	45	60	55	65	75	65	85	95	75	95	110	85	110	125	
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	8		12			14			16			18			
Max. installation torque for screws with metric connection thread	$T_{inst} \leq$	[Nm]	10		20			40			60			80			
Tangential impact screw driver ¹⁾	$T_{imp,max}$	[Nm]	160		300			400			650			650			

¹⁾ Installation with tangential impact screw driver, with maximum power output $T_{imp,max}$ acc. to manufacturer's instructions is possible

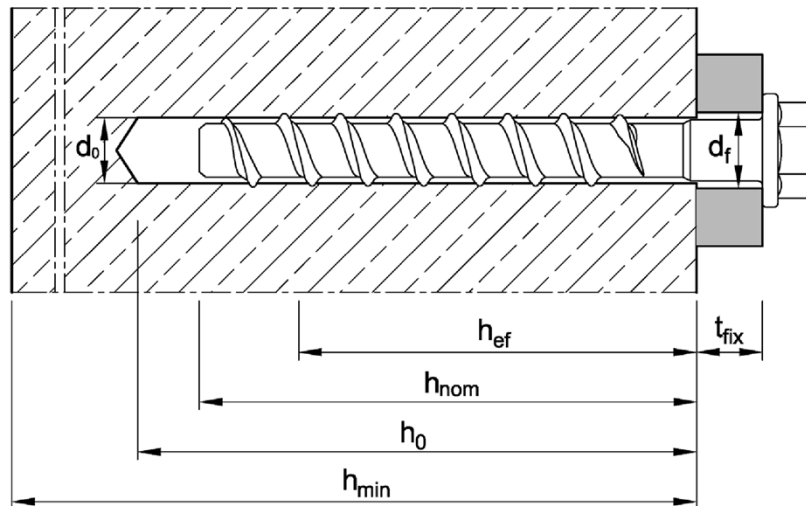


Table B2: Minimum thickness of member, minimum edge distance and minimum spacing

Alfa Concrete Screw			Anchor size														
			6		8			10			12			14			
Nominal embedment depth	h_{nom}	[mm]	40	55	45	55	65	55	75	85	65	85	100	75	100	115	
Minimum thickness of member	h_{min}	[mm]	100		100		120	100	130		120	130	150	130	150	170	
Minimum spacing	s_{min}	[mm]	40		40	50		50			50		70	50	70		
Minimum edge distance	c_{min}	[mm]	40		40	50		50			50		70	50	70		

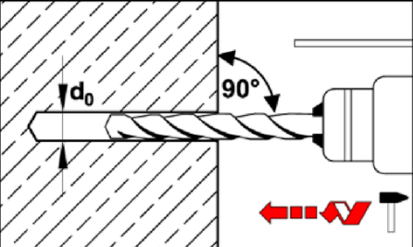
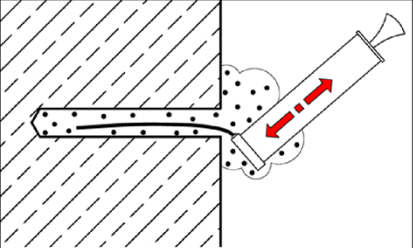
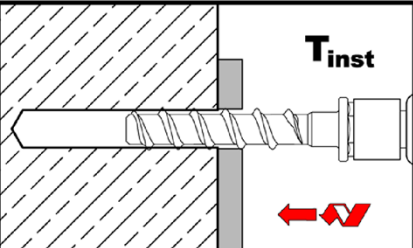
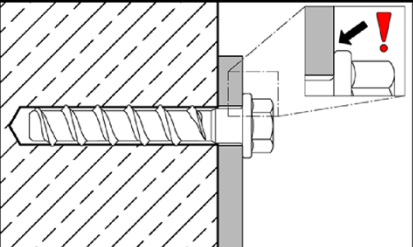
Alfa Concrete Screw

Intended use

Installation parameters / Minimum thickness of concrete member, minimum spacing and edge distance

Annex B2

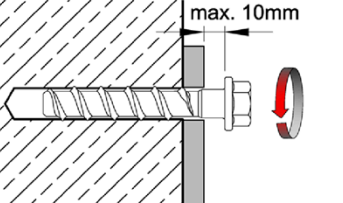
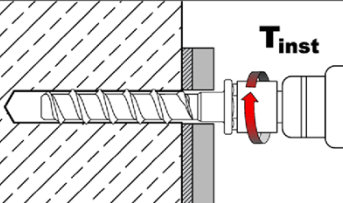
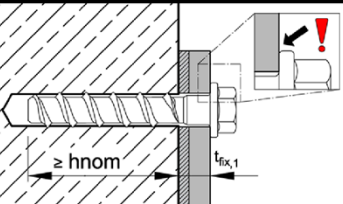
Installation instructions

Drill hole preparation and cleaning		
1		Drill hole perpendicular to concrete surface. Using a vacuum drill, continue with step 3.
2		Blow out dust or alternatively vacuum clean down to the bottom of the hole.
Installation Alfa Concrete Screw		
3		Screw in, e.g. with tangential impact screw driver or torque wrench.
4		After installation, the head of the anchor is supported on the fixture and must be undamaged.

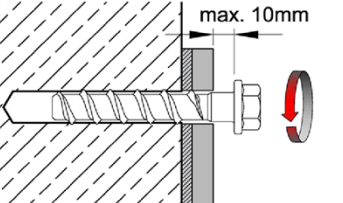
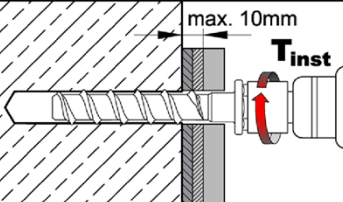
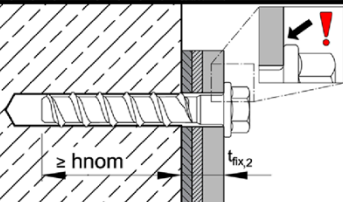
Alfa Concrete Screw	Annex B3
Intended use Installation instructions	

Installation instructions - Adjustment

1. Adjustment

5		Screw may be untightened maximum 10mm.
6		After adjustment, screw in the concrete screw with tangential impact screw driver or torque wrench.
7		After installation, the head of the anchor is supported on the fixture must be undamaged.

2. Adjustment

8		Screw may be untightened maximum 10mm.
9		After adjustment, screw in the concrete screw with tangential impact screw driver or torque wrench.
10		After installation, the head of the anchor is supported on the fixture and must be undamaged.

Note:

The fastener may be adjusted max. 2x. The fastener must not be screwed back by more than 10mm in each case. The relining carried out during adjustment must not exceed 10 mm in total. Nominal embedment depth h_{nom} must still be maintained after the adjustment.

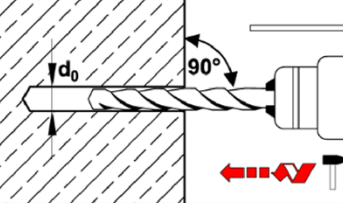
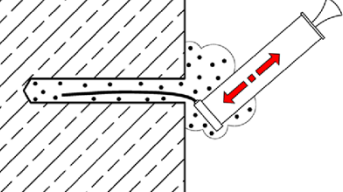
Alfa Concrete Screw

Intended use
Installation instructions - Adjustment

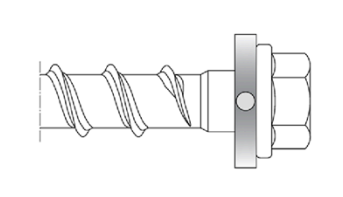
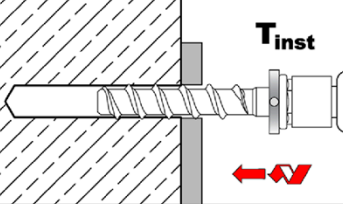
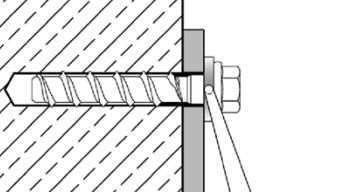
Annex B4

Installation instructions - filling of annular gap

Drill hole preparation and cleaning

1		Drill hole perpendicular to concrete surface. Using a vacuum drill, continue with step 3.
2		Blow out dust or alternatively vacuum clean down to the bottom of the hole.

Installation Alfa Concrete Screw with Alfa Filling Washer VS

3		Fit the filling washer to the concrete screw. The thickness of the filling washer must be taken into account with t_{fix} .
4		Screw in, e.g. with tangential impact screw driver or torque wrench.
5		Fill the annular gap between concrete screw and fixture with mortar (compressive strength $\geq 40 \text{ N/mm}^2$, e.g. 292 Alfa Injection mortar). Use enclosed reducing adapter. Observe information on processing of the mortar! The annular gap is completely filled, when excess mortar seeps out.

For seismic loading, the application with and without filling of annular gap is permitted (Annex C3-C4).

Alfa Concrete Screw

Intended use
Installation instructions with filling of annular gap

Annex B5

Table C1: Characteristic values for static or quasi-static loads

Alfa Concrete Screw			Anchor size														
			6		8			10			12			14			
Nominal embedment depth		h_{nom}	[mm]	40	55	45	55	65	55	75	85	65	85	100	75	100	115
Installation factor		γ_{inst}	[-]	1,0													
Tension load																	
Steel failure																	
Characteristic resistance		$N_{Rk,s}$	[kN]	14		27			45			67			94		
Partial factor		$\gamma_{Ms,N}$	[-]	1,5													
Pull-out																	
Characteristic resistance in concrete C20/25	cracked	$N_{Rk,p}$	[kN]	2,0	4,0	5,0	9,0	12	9,0	$\geq N^0_{Rk,c}{}^1)$		12	$\geq N^0_{Rk,c}{}^1)$		$\geq N^0_{Rk,c}{}^1)$		
	uncracked	$N_{Rk,p}$	[kN]	4,0	9,0	7,5	12	16	12	20	26	16					
Increasing factor for $N_{Rk,p}$ $N_{Rk,p} = \psi_c \cdot N_{Rk,p}$ (C20/25)		ψ_c	[-]	$\left(\frac{f_{ck}}{20}\right)^{0,5}$													
Concrete cone failure																	
Effective anchorage depth		h_{ef}	[mm]	31	44	35	43	52	43	60	68	50	67	80	58	79	92
Spacing		$s_{cr,N}$	[mm]	3 h_{ef}													
Edge distance		$c_{cr,N}$	[mm]	1,5 h_{ef}													
Factor k_1	cracked	$k_{cr,N}$	[-]	7,7													
	uncracked	$k_{ucr,N}$	[-]	11,0													
Splitting																	
Characteristic resistance		$N^0_{Rk,sp}$	[kN]	$\min [N_{Rk,p}; N^0_{Rk,c}{}^1)]$													
Spacing		$s_{cr,sp}$	[mm]	120	160	120	140	150	140	180	210	150	210	240	180	240	280
Edge distance		$c_{cr,sp}$	[mm]	60	80	60	70	75	70	90	105	75	105	120	90	120	140
Shear load																	
Steel failure <u>without</u> lever arm																	
Characteristic resistance		$V^0_{Rk,s}$	[kN]	7,0		13,5		17,0	22,5	34,0		33,5	42,0		56,0		
Partial factor		$\gamma_{Ms,V}$	[-]	1,25													
Ductility factor		k_7	[-]	0,8													
Steel failure <u>with</u> lever arm																	
Characteristic bending resistance		$M^0_{Rk,s}$	[Nm]	10,9		26			56			113			185		
Concrete pry-out failure																	
Pry-out factor		k_8	[-]	1,0		1,0			1,0	2,0		1,0	2,0		1,0	2,0	
Concrete edge failure																	
Effective length of anchor		$l_f = h_{ef}$	[mm]	31	44	35	43	52	43	60	68	50	67	80	58	79	92
Outside diameter of anchor		d_{nom}	[mm]	6		8			10			12			14		

¹⁾ $N_{Rk,c}^0$ according to EN 1992-4:2018

Alfa Concrete Screw

Performance

Characteristic values for static or quasi-static loads

Annex C1

Table C2: Characteristic values for seismic loading, performance category C1

Alfa Concrete Screw			Anchor size						
			6		8	10		12	14
Nominal embedment depth	h_{nom}	[mm]	40	55	65	55	85	100	115
Installation factor	γ_{inst}	[-]	1,0						
Tension load Version: IS-M-V, SW-M-E, SKK-TG-V TX, SKK-TG-V, SKK, SK-TG-V, LK-TG-V, GLK-TG-V, SK-M-V, StS-M-V, Mf-IG-V									
Steel failure									
Characteristic resistance	$N_{Rk,s,C1}$	[kN]	14		27		45	67	94
Partial factor	γ_{Ms}	[-]	1,5						
Pull-out									
Characteristic resistance	$N_{Rk,p,C1}$	[kN]	2,0	4,0	12	9,0	$\geq N_{Rk,c}^{0\ 1)}$		
Concrete cone failure									
Effective anchorage depth	h_{ef}	[mm]	31	44	52	43	68	80	92
Spacing	$s_{cr,N}$	[mm]	$3h_{ef}$						
Edge distance	$c_{cr,N}$	[mm]	$1,5h_{ef}$						
Shear load Version: IS-M-V, SW-M-E, SKK-TG-V TX, SKK-TG-V, SKK, SK-TG-V, LK-TG-V, GLK-TG-V									
Steel failure <u>without</u> lever arm									
Characteristic resistance	$V_{Rk,s,C1}$	[kN]	4,7	5,5	8,5	13,5	15,3	21,0	22,4
Partial factor	γ_{Ms}	[-]	1,25						
Concrete pry-out failure									
Pry-out factor	k_8	[-]	1,0				2,0		
Concrete edge failure									
Effective length of anchor	$l_f = h_{ef}$	[mm]	31	44	52	43	68	80	92
Outside diameter of anchor	d_{nom}	[mm]	6		8	10		12	14
Factor for filling of annular gap									
<u>with</u> filling of annular gap (acc. to Annex B5, figure 5)	α_{gap}	[-]	1,0						
<u>without</u> filling of annular gap (acc. to Annex B3)	α_{gap}	[-]	0,5						

¹⁾ $N_{Rk,c}^0$ for concrete strength class C20/25, according to EN 1992-4:2018

Alfa Concrete Screw

Performance

Characteristic resistance for **seismic loading**, performance category **C1**

Annex C2

Table C3: Characteristic values for **seismic loading**, performance category **C2**,
with filling of annular gap, Alfa Concrete Screw, zinc plated

Alfa Concrete Screw			Anchor size			
			8	10	12	14
Nominal embedment depth	h_{nom}	[mm]	65	85	100	115
Installation factor	γ_{inst}	[-]	1,0			
Tension load						
Version: IS-M-V, SW-M-E, SKK-TG-V TX, SKK-TG-V, SKK, LK-TG-V, GLK-TG-V						
Steel failure						
Characteristic resistance	$N_{Rk,s,C2}$	[kN]	27	45	67	94
Partial factor	γ_{Ms}	[-]	1,5			
Pull-out						
Characteristic resistance	$N_{Rk,p,C2}$	[kN]	2,4	5,4	7,1	10,5
Concrete cone failure						
Effective anchorage depth	h_{ef}	[mm]	52	68	80	92
Spacing	$s_{cr,N}$	[mm]	$3h_{ef}$			
Edge distance	$c_{cr,N}$	[mm]	$1,5h_{ef}$			
Shear load						
Version: IS-M-V, SW-M-E, SKK-TG-V TX, SKK-TG-V, SKK, LK-TG-V, GLK-TG-V						
Steel failure without lever arm						
Characteristic resistance	$V_{Rk,s,C2}$	[kN]	9,9	18,5	31,6	40,7
Partial factor	γ_{Ms}	[-]	1,25			
Concrete pry-out failure						
Pry-out factor	k_8	[-]	1,0	2,0		
Concrete edge failure						
Effective length of anchor	$l_f = h_{ef}$	[mm]	52	68	80	92
Outside diameter of anchor	d_{nom}	[mm]	8	10	12	14
Factor for filling of annular gap						
with filling of annular gap (acc. to Annex B5, figure 5)	α_{gap}	[-]	1,0			

Alfa Concrete Screw

Performance

Characteristic resistance for **seismic loading**, performance category **C2**
with filling of annular gap

Annex C3

Table C4: Characteristic values for **seismic loading**, performance category **C2**, **without filling of annular gap**, Alfa Concrete Screw, zinc plated

Alfa Concrete Screw			Anchor size			
			8	10	12	14
Nominal embedment depth	h_{nom}	[mm]	65	85	100	115
Installation factor	γ_{inst}	[-]	1,0			
Tension loads						
Steel failure						
Version: IS-M-V, SW-M-E, SKK-TG-V TX, SKK-TG-V, SKK, LK-TG-V, GLK-TG-V						
Characteristic resistance	$N_{Rk,s,C2}$	[kN]	27	45	67	94
Partial factor	γ_{Ms}	[-]	1,5			
Pull-out						
Version: IS-M-V, SW-M-E, SKK-TG-V TX, SKK-TG-V, SKK, LK-TG-V, GLK-TG-V						
Characteristic resistance	$N_{Rk,p,C2}$	[kN]	2,4	5,4	7,1	10,5
Steel failure Version: SK-TG-V						
Characteristic resistance	$N_{Rk,s,C2}$	[kN]	27	45	no performance assessed	
Partial factor	γ_{Ms}	[-]	1,5			
Pull-out Version: SK-TG-V						
Characteristic resistance	$N_{Rk,p,C2}$	[kN]	2,4	5,4	no performance assessed	
Concrete cone failure						
Version: IS-M-V, SW-M-E, SKK-TG-V TX, SKK-TG-V, SKK, LK-TG-V, GLK-TG-V						
Effective anchorage depth	h_{ef}	[mm]	52	68	80	92
Spacing	$s_{cr,N}$	[mm]	3 h_{ef}			
Edge distance	$c_{cr,N}$	[mm]	1,5 h_{ef}			
Shear loads						
Steel failure <u>without</u> lever arm						
Version: IS-M-V, SW-M-E, SKK-TG-V TX, SKK-TG-V, SKK, LK-TG-V, GLK-TG-V						
Characteristic resistance	$V_{Rk,s,C2}$	[kN]	10,3	21,9	24,4	23,3
Partial factor	γ_{Ms}	[-]	1,25			
Steel failure <u>without</u> lever arm Version: SK-TG-V						
Characteristic resistance	$V_{Rk,s,C2}$	[kN]	3,6	13,7	no performance assessed	
Partial factor	γ_{Ms}	[-]	1,25			
Concrete pry-out failure						
Version: IS-M-V, SW-M-E, SKK-TG-V TX, SKK-TG-V, SKK, LK-TG-V, GLK-TG-V						
Pry-out factor	k_8	[-]	1,0	2,0		
Concrete edge failure						
Version: IS-M-V, SW-M-E, SKK-TG-V TX, SKK-TG-V, SKK, LK-TG-V, GLK-TG-V						
Effective length of anchor	$l_f = h_{ef}$	[mm]	52	68	80	92
Outside diameter of anchor	d_{nom}	[mm]	8	10	12	14
Factor for annular gap without filling of annular gap	α_{gap}	[-]	0,5			

Alfa Concrete Screw

Performance

Characteristic resistance for **seismic loading**, performance category **C2**
without filling of annular gap

Annex C4

Table C5: Characteristic values of resistance under fire exposure

Alfa Concrete Screw				Anchor size													
				6		8			10			12			14		
Nominal anchorage depth h_{nom} [mm]				40	55	45	55	65	55	75	85	65	85	100	75	100	115
Steel failure (tension and shear resistance)																	
Characteristic resistance	R30	$N_{Rk,s,fi}$ = $V_{Rk,s,fi}$	[kN]	0,9		2,4			4,4			7,3			10,3		
	R60			0,8		1,7			3,3			5,8			8,2		
	R90			0,6		1,1			2,3			4,2			5,9		
	R120			0,4		0,7			1,7			3,4			4,8		
Steel failure <u>with</u> lever arm																	
Characteristic bending resistance	R30	$M^0_{Rk,s,fi}$	[Nm]	0,7		2,4			5,9			12,3			20,4		
	R60			0,6		1,8			4,5			9,7			15,9		
	R90			0,5		1,2			3,0			7,0			11,6		
	R120			0,3		0,9			2,3			5,7			9,4		
Edge distance $c_{cr,fi}$ [mm]				2 h_{ef}													
In case of fire attack from more than one side, the minimum edge distance shall be ≥ 300 mm																	
Spacing $s_{cr,fi}$ [mm]				4 h_{ef}													
The characteristic resistance for pull-out $N_{Rk,p,fi}$, concrete cone failure $N^0_{Rk,c,fi}$, concrete pry-out $V_{Rk,cp,fi}$ and concrete edge failure $V^0_{Rk,c,fi}$ shall be calculated according to EN 1992-4:2018.																	
The anchorage depth has to be increased for wet concrete by at least 30 mm compared to the given values																	

Alfa Concrete Screw

Performance
Characteristic values of resistance under **fire exposure**

Annex C5

Table C6: Displacements under static or quasi-static loads

Alfa Concrete Screw			Anchor size													
			6		8			10			12			14		
Nominal embedment depth	h_{nom}	[mm]	40	55	45	55	65	55	75	85	65	85	100	75	100	115
Tension load																
cracked concrete	Tension load	N [kN]	0,95	1,9	2,4	4,3	5,7	4,3	7,9	9,6	5,7	9,4	12,3	7,6	12,0	15,1
	Displacement	δ_{N0} [mm]	0,3	0,6	0,6	0,7	0,8	0,6	0,5	0,9	0,9	0,5	1,0	0,5	0,8	0,7
		$\delta_{N\infty}$ [mm]	0,4	0,4	0,6	1,0	0,9	0,4	1,2	1,2	1,0	1,2	1,2	0,9	1,2	1,0
uncracked concrete	Tension load	N [kN]	1,9	4,3	3,6	5,7	7,6	5,7	9,5	11,9	7,6	13,2	17,2	10,6	16,9	21,2
	Displacement	δ_{N0} [mm]	0,4	0,6	0,7	0,9	0,5	0,7	1,1	1,0	1,0	1,1	1,2	0,9	1,2	0,8
		$\delta_{N\infty}$ [mm]	0,4	0,4	0,6	1,0	0,9	0,4	1,2	1,2	1,0	1,2	1,2	0,9	1,2	1,0
Shear load																
	Shear load	V [kN]	3,3		8,6			16,2			20,0			30,5		
	Displacement	δ_{V0} [mm]	1,55		2,7			2,7			4,0			3,1		
		$\delta_{V\infty}$ [mm]	3,1		4,1			4,3			6,0			4,7		

Alfa Concrete Screw	Annex C6
Performance Displacements under static or quasi-static loads	

**Table C7: Displacements under seismic loading, performance category C2
with filling of annular gap, Alfa Concrete Screw, zinc plated**

Alfa Concrete Screw			Anchor size			
			8	10	12	14
Nominal embedment depth	h_{nom}	[mm]	65	85	100	115
Tension load						
Version: IS-M-V, SW-M-E, SKK-TG-V TX, SKK-TG-V, SKK, LK-TG-V, GLK-TG-V						
Displacement DLS	$\delta_{N,C2(DLS)}$	[mm]	0,66	0,32	0,57	1,16
Displacement ULS	$\delta_{N,C2(ULS)}$	[mm]	1,74	1,36	2,36	4,39
Shear load						
Version: IS-M-V, SW-M-E, SKK-TG-V TX, SKK-TG-V, SKK, LK-TG-V, GLK-TG-V (with clearance hole)						
Displacement DLS	$\delta_{V,C2(DLS)}$	[mm]	1,68	2,91	1,88	2,42
Displacement ULS	$\delta_{V,C2(ULS)}$	[mm]	5,19	6,72	5,37	9,27

**Table C8: Displacements under seismic loading, performance category C2
without filling of annular gap, Alfa Concrete Screw, zinc plated**

Alfa Concrete Screw			Anchor size			
			8	10	12	14
Nominal embedment depth	h_{nom}	[mm]	65	85	100	115
Tension load						
Version: IS-M-V, SW-M-E, SKK-TG-V TX, SKK-TG-V, SKK, LK-TG-V, GLK-TG-V						
Displacement DLS	$\delta_{N,C2(DLS)}$	[mm]	0,66	0,32	0,57	1,16
Displacement ULS	$\delta_{N,C2(ULS)}$	[mm]	1,74	1,36	2,36	4,39
Version: SK-TG-V						
Displacement DLS	$\delta_{N,C2(DLS)}$	[mm]	0,66	0,32	no performance assessed	
Displacement ULS	$\delta_{N,C2(ULS)}$	[mm]	1,74	1,36		
Shear load						
Version: IS-M-V, SW-M-E, SKK-TG-V TX, SKK-TG-V, SKK, LK-TG-V, GLK-TG-V (with clearance hole)						
Displacement DLS	$\delta_{V,C2(DLS)}$	[mm]	4,21	4,71	4,42	5,60
Displacement ULS	$\delta_{V,C2(ULS)}$	[mm]	7,13	8,83	6,95	12,63
Version: SK-TG-V (with clearance hole)						
Displacement DLS	$\delta_{V,C2(DLS)}$	[mm]	2,51	2,98	no performance assessed	
Displacement ULS	$\delta_{V,C2(ULS)}$	[mm]	7,76	6,25		

Alfa Concrete Screw

Performance
Displacements under **seismic loading**, performance category **C2**

Annex C7